

PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

No. 10072 A.D. 1946.

Electric Connectors

I, WILLIAM GEORGE CURWAIN, a British Subject, of 40, Coombe Wood Hill, Purley, Surrey, do hereby declare the nature of this invention to be as follows:—

The present invention relates to electric connectors of the pin and socket type and it is concerned with the construction of a multi-pin plug which is adaptable to socket outlets having different socket spacings and sizes, such plugs being used to enable portable electric appliances to be connected to wall outlet socket fittings.

Various sizes of socket outlet fittings are in use at the present time suitable for supplying various types of appliances; for example electric fires generally call for the use of a relatively large sized socket with widely spaced contact pins of substantial diameter while appliances of smaller power rating generally use a smaller type of socket with smaller pins and smaller spacing of the pins. Furthermore certain types of socket are provided with an earthing socket and in this case the spacing of the live sockets is again different to prevent the insertion of an incorrect type of plug in the socket. This multiplicity of pin and socket spacings is very inconvenient especially where a small power appliance is to be connected, such as a reading lamp, wireless receiver, small electric fire or the like since one of the smaller socket outlet fittings may not be conveniently placed for use and it may not be desirable to provide a large sized plug fitting because the appliance may be used in other locations where only a small socket is available.

The object of the invention is to provide an adjustable connecting plug which can be conveniently manipulated to fit outlet sockets having various socket spacings and socket sizes and which is suitable for appliances having relatively small power ratings.

In accordance with the present inven-

tion an electric connector plug includes a plurality of contact pins and a slidable section carrying one of the pins said section being subjected to a spring tending to urge the pins relatively to make electrical connection with the sockets of the outlet fitting and means being provided externally of the plug to enable said slidable section to be moved against the spring to set the pins to a desired setting before insertion of the plug into the socket.

The pins are of a sufficient size to make good electric contact with the smallest socket to be accommodated and when the pins are set for the larger sized sockets the action of the spring is such as to press the pins, smaller in diameter than said sockets, against the side of said socket to make an effective electrical contact therewith. Conveniently the spring may be designed to urge the pins outwardly and the connector may embody finger or hand grip means to compress the spring and reduce the pin spacing to the desired extent to fit any required socket outlet.

In one convenient construction of connector according to the invention the connector includes a body portion of insulating material having one pin mounted thereon and a guide portion in said body for a slidable section carrying another pin; flexible lead connections being made to said pins in well known manner. The guide may be formed by a slot formed in the body of the connector and opening into the face of the body carrying the contact pins. The slidable section may comprise a piece of insulating material fitted to slide within the slot for example by means of ledges, rebates, dovetail section projections or the like securing a smooth movement of the slidable section within the body. A compression spring located within the body is adapted to urge outwardly the slidable section. A portion of said slidable section may project outside the body to form a manipulating handle

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or grip whereby gripping the connector between the fingers can be arranged to actuate the sliding section against the spring and thereby to bring the contact pins closer together.

Alternatively a pivoted operating lever could be provided on the rear of the connector which when gripped serves to move the slidable section against the spring. In one arrangement a short rigid tubular section could be provided on the rear of the connector serving as a guide for the flexible wire leads and the pivoted operating lever could run along the side of the said guide, which may if desired be provided with a deep lengthwise groove to take the lever in its depressed position. In this arrangement it is convenient to arrange for the spring to urge the slidable section inwardly to cause the pins to approach one another and for the action of depression of the lever to move the pins apart.

The pins may be of cylindrical form and they may be split if desired to give resilience. They are however preferably "waisted," having a thinner portion at the base near the connector body. This arrangement provides for efficient contact to be maintained where the pin is substantially smaller than the socket and where there would otherwise be the danger that the insulating cover of the outlet socket would prevent complete engagement of the pin in the socket.

In an alternative construction the pins could be of spade form having extended portions at the outer ends of resilient metal said extended portions being more or less curved and capable of being deformed on insertion into the sockets—to a greater or less extent according to the size of the socket—and thus maintaining efficient electrical contact. Said pins could also include pivoted contact sections expandable into electrical contact with the sockets by means of springs.

If a very wide range of socket sizes is to be accommodated the pins could be used with separate tubular members which are slipped into place on the pins when the larger sizes of socket are to be fitted or such tubular members could be arranged to slide down the pins to an inoperative position concealed within recesses in the body of the connector and in the sliding section; the pins being anchored in the bases of said recesses.

Heretofore a two-pin type of plug has been described but the connector may also embody a third or earthing pin in which case the two line pins are mounted on

independently movable slidable sections, or the earth pin and one of the line pins may be movable.

The connector according to the present invention may also be provided with one or more sets of socket outlets. When a plurality of such sets of outlets is provided, the different outlets may have different socket spacings. This outlet or these outlets are located on the face opposite that from which the pins project or the connector may be provided with a plurality of facets each provided with a socket outlet. In one simple form of connector of this type the body thereof may be of circular form with the contact pins projecting from one circular face thereof, one of said pins being laterally adjustable from operating means such as finger grips on the periphery of the body. The circular face opposite the contact pins may be provided with contact sockets connected electrically with the contact pins; the connection to the movable pin being, for example, by means of a flexible wire connection or by means of a sliding spring contact. Provision is made for the entry of flexible wire connections through an aperture located in the periphery of the body, said wires being connected to the pins or sockets to enable an appliance to be connected if required. A connector of this type can thus be used either as an adaptor to plug into an existing socket outlet and into which other standard plugs or into which another connector according to this invention can be fitted or it can be used as a connector for an appliance or it can be used both as an adaptor to which other plugs can be fitted and as a connector for connecting an appliance to an electric supply.

Preferably a fuse such as a cartridge fuse is mounted in the body of the connector to protect the appliance against faults or overloads or a simple type of circuit breaker operated by a small electromagnet or by a bi-metal strip operated by a series heater could be used. In this case the fuse or circuit breaker is preferably only accessible from the pin-carrying face of the connector so that these parts can only be examined, replaced or reset when the connector has been removed from the socket. Also a switch could be mounted in the connector if desired.

Dated the 30th day of March, 1946.

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PROVISIONAL SPECIFICATION

No. 15804 A.D. 1946.

Electric Connectors

I, WILLIAM GEORGE CURWAIN, a British Subject, of 40, Coombe Wood Hill, Purley, Surrey, do hereby declare the nature of this invention to be as follows:—

In British Application No. 10072/46 an electric connector is described including a plurality of contact pins and a slidable section carrying one of said pins to permit adjustment of the connector to fit different sizes of outlet sockets; and the present invention embodies further features and improvements relating to the arrangement of said contact pins.

In accordance with the present invention to enable outlet fittings having different sizes of contact sockets to be accommodated, the contact pin structure includes pin elements of different sizes adapted to be brought into the operative positions at will to fit different sizes of sockets.

In one construction the pins are removably mounted in the body of the connector and in the slidable section and are of different sizes at the two ends so that the pin can be withdrawn and reversed end-for-end to provide either of two pin diameters. In a construction of this kind the contact pin structure is threaded at about its mid-point and is adapted to be accommodated in a screwed housing in the body of the connector; it being merely necessary to unscrew the pin and reverse it end-for-end when it is desired to change the pin size.

Instead of using a screwed socket a form of pin and slot connection can be employed the contact pins being pushed into position and then rotated to engage the pin and slot and hold the contact pin in either working position. In an embodiment of this kind the sliding section could preferably be arranged to interlock with the pins, the slidable section being for instance moved to either extreme position before the pins can be removed and after such removal and reinsertion, the pins must be turned so far so that the pin and slot connection is definitely engaged before the slidable section can move from this extreme position to bring the pins to desired relative spacings; parts associated with the slidable section engaging for example cut away portions of the pins and permitting movement of such slidable section only when the contact pins are set in correct locking position.

In an alternative arrangement each pin

structure may include two contact pins of different sizes secured at an angle one to the other and mounted on a pivotal support permitting either sized pin to be moved to the projecting position, that pin which is out of use being located in a slot in the face of the connector; to change the pin size it is merely necessary to press the projecting pin down with the fingers through 90° which brings the other pin into use.

In the case of a connector having only the two live pins danger would arise of the connector being fitted to a three pin outlet fitting, having also an earthing socket, with one of the pins engaging the earthing socket and an interlocking or abutment means can be provided to prevent the contact pins being so widely spaced that such engagement is possible. For instance when the smaller pins, corresponding say to the standard 5 amp. socket, are in use the interlock prevents the pins moving so far apart as to permit engagement with either live socket and with the earthing socket. Likewise when the larger pins (say 15 amp. size) are in use the outward movement of the pins is so limited that the pins could not engage an earth socket at the same time as a live socket. This arrangement is possible because on the standard sockets the earth pin is more widely spaced from the live pins than the spacing of the live sockets themselves.

In the foregoing embodiments of the invention the relatively movable pin may be mounted on a pivotal carrier or in any other relatively movable manner to permit adjustment movement thereof and the present invention accordingly embraces an electric connector having exchangeable pins of which the support means for at least one pin is movable relatively to the other to permit different spacings for each pin size to be allowed for.

In a further embodiment the relatively fixed pin may be fixed in alternative mountings in the body of the connector; for instance where the pin is reversible end-for-end for different sizes, when the larger pin size is required the pin may be screwed or otherwise fixed in a mounting giving a wider setting of the contacts than when the smaller pin size is required. In this case again interlock means may be provided to prevent the smaller sized pin being used at the wider spacing. With this arrangement the degree of movement

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of the movable pin may be considerably reduced since it only has to allow for the different socket spacings to be expected for either pin size. Where two pins are fixed at right angles and pivotally mounted they may be so disposed that when the small pins are turned up to the projecting position their relative spacing is smaller than when the larger pins are turned up; here again the degree of movement of the movable pin structure need only be relatively small.

In the application of the invention to a connector having an earthing pin also, this latter is preferably removable or reversible, with different sizes at each end, while the live contact pins are each movable in directions radially in relation to the earthing pin by the operation of a common control member. The live pins may each be reversible to offer different sizes while the earthing pin, also of different sizes at each end may be accommodated in either of two mountings in the connector body. Alternatively only one of the live pins may be movably mounted and may move in a direction mainly towards and away from the other live pin. In these embodiments, if the connector is to be used with a "two pin" type socket the earthing pin is removed and the connector used in the manner already described; with a "three-pin" type socket, the earthing pin is used on the connector according to the size of socket, and the correct live pins brought into position and adjusted in spacing by the external control to fit the live sockets.

Where the relatively fixed pin is accommodated in alternative mountings giving alternative main spacings, and consequently only a relatively small movement of the movable pin need be allowed for, said movable pin could be mounted in a resilient mounting and the external control for moving such pin omitted. The pins are well rounded at

their outer ends so that the pins will locate themselves when applied to the socket outlet. The aforesaid resilient mounting may comprise a block of suitable material such as soft rubber or the mounting may be centred by means of blade springs or the like.

In the case of a connector provided with the two live pins but no earthing pin a separate pin of insulating material may be attached to the connector, for example by means of a flexible cord; this pin can be used with the "shuttered" type of three pin outlet fittings, before applying the connector, enabling the shutters protecting the live sockets to be moved out of position. The said pin, being attached to the connector, is withdrawn when the connector is removed from the outlet.

In accordance with a further embodiment, the contact pins are mounted on a separate carrier removably mounted on the face of the connector. Said carrier is reversible and carries the contact pins projecting from both faces thereof, those contacts not in use projecting into the body of the connector. The contacts on the two sides of the carrier are of different sizes and at appropriate spacings and one of said contacts is slidably or resiliently mounted. An earthing pin may be mounted on a separate carrier which can be reversed when the earthing pin facility is not required; such pin would preferably be of the expansible contact type to fit the different sizes of sockets to be expected in practice. Contact is made with the live pins and with the earthing pin by means of suitable contact blades within the body of the connector and to which the external connections are made, said blades contacting those parts of the live pins projecting within the body of the connector.

Dated this 24th day of May, 1946.

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COMPLETE SPECIFICATION

Electric Connectors

I, WILLIAM GEORGE CURWAIN, a British Subject, of 40, Coombe Wood Hill, Purley, Surrey, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

The present invention relates to electric connectors of the pin and socket type and it is concerned with the type of multi-pin plug which is adaptable to socket outlets having different socket spacings and

sizes, such plugs having at least one pin mounted on an eccentric or on a slide to enable portable electric appliances to be connected to various wall outlet socket fittings.

Connectors of this type are used because various sizes of socket outlet fittings are met with at the present time for supplying various types of appliances; for example electric fires generally call for the use of a relatively large sized socket with widely spaced contact pins of sub-

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stantial diameter while appliances of smaller power rating generally use a smaller type of socket with smaller pins and smaller spacing of the pins. Furthermore certain types of socket are provided with an earthing socket and in this case the spacing of the live sockets is again different to prevent the insertion of an incorrect type of plug in the socket. This multiplicity of pin and socket spacings is very inconvenient especially where a small power appliance is to be connected, such as a reading lamp, wireless receiver, small electric fire or the like since one of the smaller socket outlet fittings may not be conveniently placed for use and it may not be desirable to provide a large sized plug fitting because the appliance may be used in other locations where only a small socket is available.

The object of the invention is to provide an adjustable connecting plug which can be conveniently manipulated to fit outlet sockets having various socket spacings and socket sizes and which is suitable for appliances having relatively small power ratings.

In accordance with the present invention an electric connector comprises a body portion carrying a plurality of contact elements at least one of which is movable relatively to the body portion so that all the elements remain parallel one to the other, and a rigid insulating member providing a mounting for said movable element having a part projecting outside the body portion to provide a means of adjustment for the movable element or elements.

The movable contact element, which may be for example a contact pin or the like, may be mounted on a slidable element extended to the outside of the connector body and subject to a spring acting in the outward direction, or alternatively the mounting of the movable pin or like contact element may comprise a rotatable disc on which the contact pin is eccentrically mounted, the said disc embodying a knurled peripheral portion projecting outside the body and adapted for rotary manipulation.

The contact elements themselves are preferably of the type permitting a satisfactory contact with sockets of different bores, said elements embodying for example spring blade or leaf portions or for example a pair of plates fitting within a slot in the contact pin and urged outwardly to engage a contact socket by spring means. Alternatively contact pins may be utilised which are reversible in position in the connector, said pins embodying a smaller diameter portion at one end and a larger diameter portion at the

other end.

The connecting device according to the present invention may be of the two pin type; an additional contact pin may be provided if desired to act as an earthing pin for use in conjunction with socket outlets embodying an earthing socket as well as two live sockets.

The features of the invention are shown by way of example on the accompanying drawings illustrating several embodiments of the invention and in which:

Figs. 1 and 2 are under plan views of two forms of connector according to the invention.

Fig. 3 is a section of line 3—3 Fig. 2.

Figs. 4 and 5 are plan and sectional views respectively of another form of the invention, embodying a third earthing pin.

Fig. 6 illustrates a modification of the embodiment of Figs. 4 and 5 embodying socket outlets on the rear face.

Fig. 7 is a detail view of a reversible pin.

Figs. 8 and 9 are sectional and under plan views respectively of a form of connector embodying an earth pin and two live pins eccentrically mounted on discs.

Fig. 10 is a perspective view of a connector provided with a plurality of socket outlets.

Fig. 11 is a detail view of a reversible pin with bayonet socket mounting.

Fig. 12 is a detail view of a pin provided with a sliding sleeve thereover.

Fig. 13 is a diagrammatic view of another form of the invention; and

Figs. 14 and 15 are detail views showing spring pins adapted to fit sockets of different diameters.

Referring first to the form of invention shown on Fig. 1 the connector body 21 is provided with two live pins 22, 23. The pin 22 is rigidly mounted while the pin 23 is fixed to a slidable carrier of rigid insulating material 24 projecting beyond the periphery of the connector and subject to a spring 25. Preferably a fuse, for example a replaceable tubular cartridge fuse 26, is mounted within the body, flexible lead connections being taken to the pin 22 and to one carrier for the fuse 26, the other carrier thereof connecting to pin 23. To adjust this connector for different spacings it is merely necessary to press the projecting part of carrier 24 which contracts the pins 22, 23 and enables different socket outlets of different spacings to be accommodated. By this arrangement the pins 22, 23 always remain parallel one to the other. As the diameter of the sockets may be different for different spacings, the pins are preferably of a springy or expansible nature so

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that they can give good contact under varying conditions, for example the contact pins may embody springy bowed portions 26 Fig. 3, with laterally extended springy portions 27 Fig. 14 with pivoted, spring influenced blade-like members 28 Fig. 15 or they may be formed as described more fully hereinafter with reference to Figs. 8 and 9. Alternatively the pins may be reversible with different diameter portions at each end as shown at 42-43 Fig. 7. The central screw-threaded part 44 may be accommodated in a threaded aperture in the carrier 24, or 34 (Figs. 1 or 4) or in disc 29 (Figs. 2 and 3). Alternatively the bayonet mounting shown in Fig. 11 can be used.

Figs. 2 and 3 illustrate another form of the invention in which the movable pin 23 is fixed to a disc 29 of rigid insulating material rotatably mounted in the body of the connector, the pin 23 being eccentric in relation to the axis of the mounting. Preferably said disc is provided with a serrated or knurled portion 30 which extends outside the connector body and provides a manipulating element which can be rotated with the thumb or finger to vary the spacing of the pins 22, 23.

In the form shown on Figs. 4 and 5, an earthing pin 31 is provided in addition to the live pins 22, 23; the latter projecting through facial slots 32 in the connector body which are directed more or less radially in relation to the earth pin 31. The pins 22, 23 are also carried by a sliding carrier 34 within the body, which carrier is of T-shape and provides slotted mountings 35 for the pins 22, 23. In this case the carrier 34 is shown in the depressed position giving the minimum spacing between the contact elements; the carrier 34 is subjected to a spring not shown and one or more fuses may be provided within the body 21 if desired. A cord grip 38 may be provided to grip the flexible wire connections.

Fig. 6 illustrates an embodiment, in general similar to Figs. 4 and 5 and wherein a plurality of outlet sockets 37 are provided on the rear face of the connector which permits the connector to function either as an adapter into which another connector plug can be fitted while it may also be used to connect an appliance, the flex being taken in through a cord grip indicated diagrammatically at 38.

The connecting devices so far described may be readily designed to fit a variety of outlet sockets having different spacings and diameters of the sockets and even when an earth pin is not provided the connectors can be fitted to most types of three

pin sockets, that is sockets embodying an earth connection.

In some cases however shuttered sockets may be met with in which the live sockets are protected by an insulating shutter which is moved out of the way on the insertion of the connector, by means of the earthing pin thereof and forms of the invention including an earthing pin are preferably used. If however a two pin connector is to be used the latter may be provided with an insulating rod conveniently connected to the body 21 by means of a flexible cord or the like; the rod is preliminarily inserted in the earth socket and shifts the shutter elements from the live sockets and thus permits the connector to be inserted.

In the embodiment shown on Figs. 8 and 9 the connector includes a body 21 supporting two live pins 22, 23 and an earth pin 31. All of said pins include two blade-like portions located in slots in the pins and pressed in the outward direction by means of inclined slots cooperating with cross pins 61 extending across the slots. The blade-like portions are subject to springs described hereinafter which tend to move them away from the body in the axial direction and by means of said slots also tend to cause the said portions to expand widthwise in opposite directions. The forward ends of the blade-like portions are curved so that on insertion of the connector in a socket outlet effective connection is made with the sockets.

The live pins 22, 23 are each mounted on a disc 29 which is fixed between discs 30 and 30a of insulating material. Each disc 30 is provided with a toothed periphery which is in engagement with the toothed part of the other disc. The disc 30 may include a part of smaller diameter and this part as well as the outer disc 30a may fit freely within apertures in cover plates 62 and 63. The disc 29 which may be of metal may be of somewhat larger diameter than the disc 30a with the result that the pin assembly is rotatably journalled in the cover assembly 62, 63, 64 and furthermore the two assemblies carrying the live pins 22, 23 are connected together and rotate in opposite directions when either toothed portion 30 is operated by the finger or thumb, such rotation comprising the means for the adjustment of the spacing of pins 22, 23. Said adjustment also regulates the spacing of the pins 22, 23 from the earth pin 31 and by appropriate selection of the positioning of the centres of the rotation of the discs 29, 30 and 30a a substantial choice of spacings to suit different types of socket outlets is available.

The earth pin 31 is preferably adapted

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to be pressed back into the body 21 when the connector is to be used with a socket outlet not provided with an earthing connection; i.e. a two-pin socket. To this and the earth pin 31 is located in an aperture in the cover plate assembly 62, 63, 64 and a spring 65 is arranged at the rear within the body 21. When the connector is offered to an outlet not having an earthing connection the earth pin 31 is thus pressed into the body against the spring 65. When however an earth socket is provided the spring 65 maintains the pin 31 in the forward, operative position shown.

Conveniently however means are provided for locking the earthing pin 31 in the forward position when the live pins 22, 23 are set for sparings corresponding to those where an earthing socket is provided. This arrangement is possible because standard socket outlets have different spacings of the live pins where an earthing socket is provided; this requires a different rotary position of the assembly of discs 29, 30 and 30a. One of the discs 29 is provided with a profiled surface to provide cam portions 66 to co-operate with a locking element 67 subject to a spring 68 and which is adapted to enter a recess 69 in the shank of the earthing pin except when the cam disc 29 is in those positions corresponding to two pin socket outlets. In the latter positions the spring 68 moves the locking element 67 to a withdrawn position which permits the earthing pin 31 to be pressed back into the body 21 when the connector is inserted into the outlet. Each disc 30a may be provided with an index mark 70 and corresponding markings may be provided on the surface of the under cover plate 62 to assist in setting the disc assembly 29, 30, 30a to required positions.

Conveniently, as applied to a connector for British Standard sockets the connector may fit 5 amp. two-pin, 5 amp. three-pin, 15 amp. two-pin and 15 amp. three-pin sockets. The cam portions 66 come in line with the locking element 67 in the two two-pin positions, releasing the earthing pin in these positions so that the latter may be pressed back when the connector is presented to such outlet fittings: the depression of the pin 31 is of course effected by the operation of applying the connector to the outlet.

In this form the fuse 26 may be freely located in an aperture concentric with the disc 30, connection being made from the end cap of the fuse to the metal disc 29 by means of a spring. The other end of the fuse is rigidly mounted in a spring holder part of which is shown at 71; this holder may include clamp screws for con-

nection to flexible wire connections. Connection to the earth wire may be made by a screw terminal 72 fixed to the end of the wire spring 65.

The live pins may include a spring 73 located in a hollow bore therein which spring acts on the blade like elements to effect expansion thereof as already referred to. The earth pin 31 may be provided with a bore to take a guide pin 74 against the lower end of which the spring 65 bears. The upper end of the pin 74 presses against the blade-like members; hence spring 65 effects expansion of the earth pin 31 and also tends to maintain same in the projected position.

Fig. 10 illustrates a combined connector and adapter according to the invention; the arrangement of the live pins 22, 23 being generally similar to that shown on Fig. 1 but in this case the body 21 is of prismatic form and provided with sets of socket outlets 37 on one or more faces. On this figure a flexible wire connection 80 is indicated. If desired the connector may be used as an adapter to which other plugs can be fitted, using the outlet sockets 37. The connector may also be used to connect an outlet appliance by the flexible connection 80; and it is also possible still to use the connector for fitting other plugs at the connections 37.

Fig. 12 shows an alternative method for providing for pins of different diameters. In this case the pin 22 is surrounded by a sleeve 81 which may either be in the position shown in which case it is retained by a locking device 82, or by releasing the latter the sleeve 81 can be slid down the pin 22 to an out of use position within the body 21.

Fig. 13 shows a still further modification wherein the movable pin 23 is mounted on a slide 24 which is controlled by a lever 85 at the rear. In this form a guide 86 for a flexible wire lead may be provided at the rear, the lever 85 lying near the guide so that gripping these parts in the hand results in adjustment of the pins 22, 23.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electric connector comprising a body portion carrying a plurality of contact elements at least one of which is movable relatively to the body portion so that all the elements remain parallel one to the other, and a rigid insulating member providing a mounting for said movable element having a part projecting outside the body portion to provide a means of

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adjustment for the movable element or elements.

2. An electric connector provided with adjustable contact elements to fit outlet sockets or the like having different spacings, comprising a rigid body member having therein a relatively movable rigid insulating mounting for one contact element which permits that element to move always parallel to the other contact element or elements also mounted on said body, said mounting including a manipulating member projecting outside the body for moving the relatively movable mounting.

3. An electric connector provided with adjustable contact elements to fit outlet sockets or the like having different spacings, comprising a rigid body member providing a mounting for a relatively slidable rigid insulating member on which one of the contact elements is mounted, said member projecting to the outside of the body to provide a manipulating means whereby the spacing of the contact elements is controlled, said contact elements always remaining parallel one to the other.

4. An electric connector provided with adjustable contact elements to fit outlet sockets or the like having different spacings, comprising a rigid body member providing a mounting for a relatively rotatable rigid insulating member on which one of the contact elements is eccentrically mounted, said rotatable member projecting outside the connector body.

5. An electric connector provided with adjustable contact elements to fit outlet sockets or the like having different spacings, comprising a rigid body member providing a mounting for two rotatable discs of rigid insulating material having toothed peripheries meshing one with the other, contact elements being eccentrically mounted on each disc and the toothed parts of the discs being accessible from the outer surface of the body whereby the said discs can be rotated to adjust the spacing of the contact elements thereon.

6. An electric connector according to any of the foregoing claims wherein the contact elements comprise pins provided with expansible means to fit outlet sockets having different bores.

7. An electric connector according to claim 6 and any of claims 1 to 5 and comprising two live pins and an earth pin, the relative spacing of the live pins and their spacing from the earth pin being adjustable but all of said pins always remaining parallel one to the other.

8. An electric connector according to claims 5 and 7 wherein the rotary disc mounting is provided for the live pins,

rotation of said discs in unison effecting a modification in the spacing of said pins and a simultaneous modification of their spacing from the earth pin.

9. An electric connector according to claim 7 or 8 wherein the earth pin is adapted to move or be moved into an inoperative position when the connector is to be used with an outlet not provided with an earth socket.

10. An electric connector according to claims 8 and 9 wherein an interlock is provided to maintain the earth pin in operative position when the discs are set to positions corresponding to outlet fittings provided with earth sockets.

11. An electric connector according to any of claims 7 to 10 wherein the earth pin is slidably mounted and is urged forward to the operative position by means of a spring.

12. An electric connector according to claims 8 and 11 wherein one of said discs is provided with a cam like surface co-operating with a locking member which engages the earth pin assembly to retain same in the forwardly projected position in positions of said discs corresponding to pin spacings employed in sockets provided with an earthing socket.

13. An electric connector according to claim 7 and comprising a slidable carrier having therein slidable mountings for two live pins, the connector body being provided with slots directed more or less radially in relation to an earth pin, whereby when the carrier is moved from outside the body the live pins are slid in said slots.

14. An electric connector according to claim 3 or 13 wherein the slidable mounting is subject to a spring which tends to force said mounting in the outward direction.

15. An electric connector according to any of the foregoing claims wherein the contact elements or pins comprise reversible pins having different diameters at the two ends, said pins being supported at a mid-point thereof by a threaded portion, by a bayonet fitting of the like.

16. An electric connector according to any of the foregoing claims wherein the contact element or pin includes a section slidable thereover to increase the effective diameter thereof to fit sockets of larger bores, said section when out of use being accommodated within the body of the connector.

17. An electric connector according to any of the foregoing claims and provided with outlet sockets on the connector body permitting the connector to be used either as a connector or as an adapter or for both purposes.

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18. An electric connector according to any of the foregoing claims wherein one or more fuses is/are located within the body of the connector. described with reference to Figs. 8 and 9 of the accompanying drawings.
- 5 19. Electric connectors substantially as herein described and illustrated. Dated this 31st day of March, 1947.
20. An electric connector as herein FREDERICK MOSS,
Chartered Patent Agent,
229, Strand, London, W.C.2.

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PATENTS AND DESIGNS ACTS, 1907 TO 1948

SPECIFICATION NO. 607,850

Reference has been directed, in pursuance of Section 8 sub-section (2), of the Patents and Designs Acts, 1907 to 1948 to Specification No. 597,963.

THE PATENT OFFICE,
28th October, 1949.

DS 13942/2B/3304 150 10/49 R

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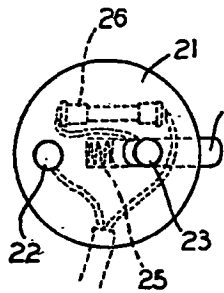


FIG. 1

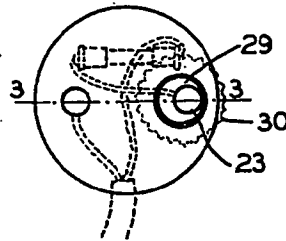


FIG. 2

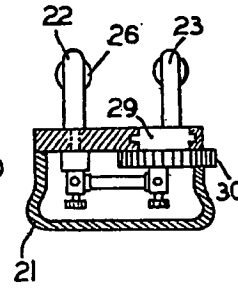


FIG. 3

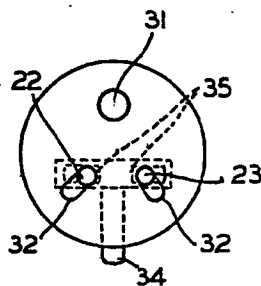


FIG. 4

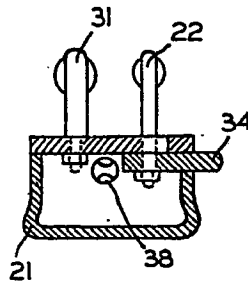


FIG. 5

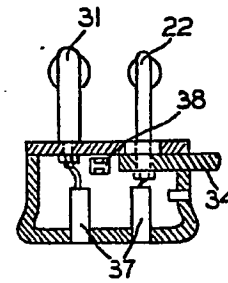


FIG. 6

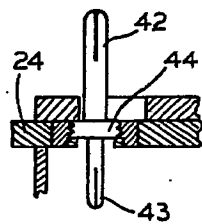


FIG. 7

H. M. S. O. (Ty. P.)

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SHEET 2

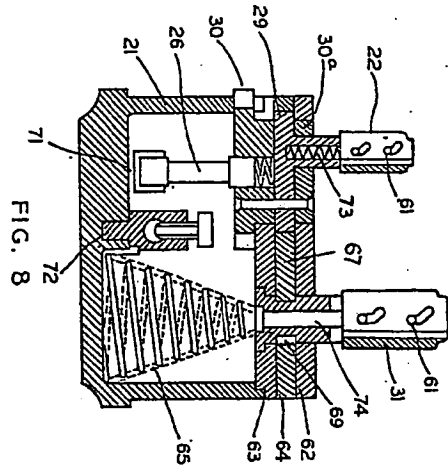


FIG. 8

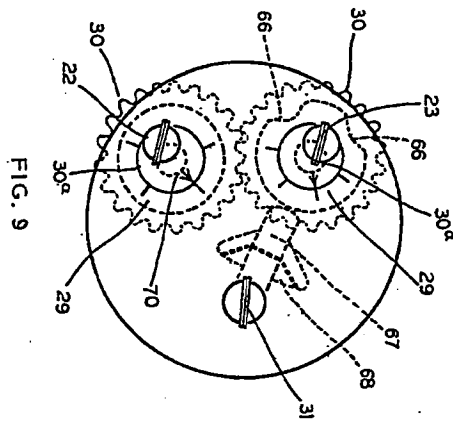


FIG. 9

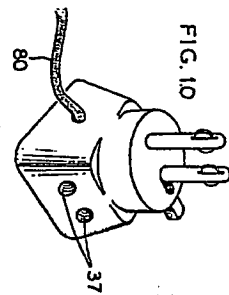


FIG. 10

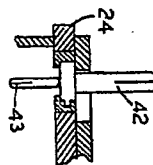


FIG. 11

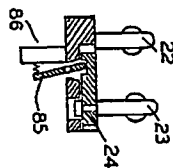


FIG. 13

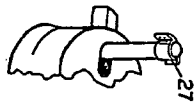


FIG. 14

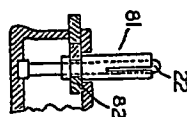


FIG. 12

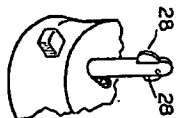


FIG. 15

3 SHEETS
SHEET 3

444,507 (P)

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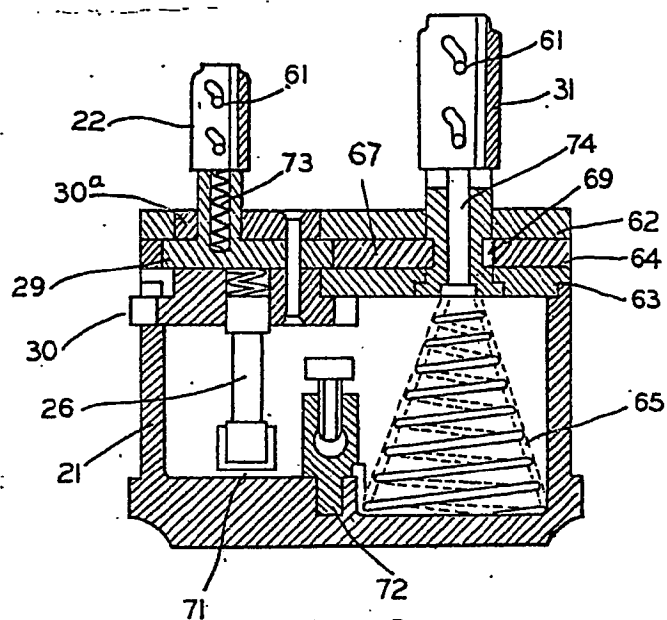


FIG. 8

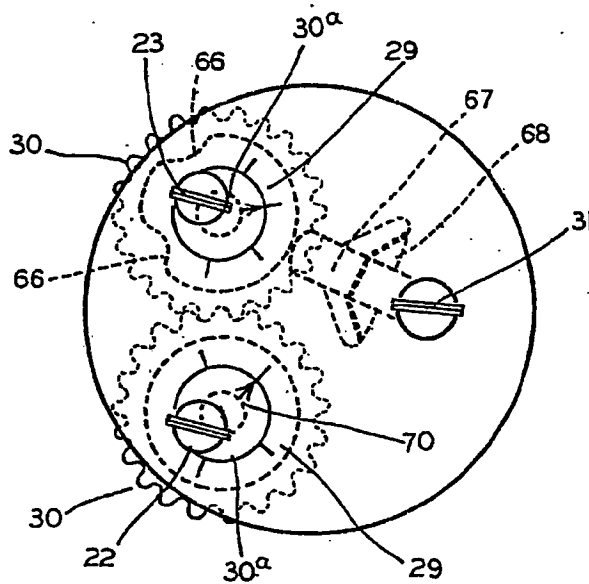


FIG. 9

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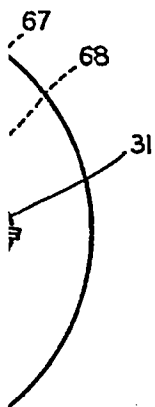
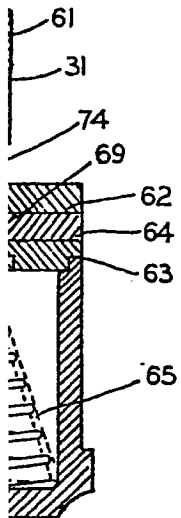


FIG. 10

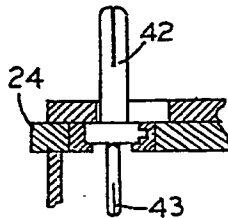
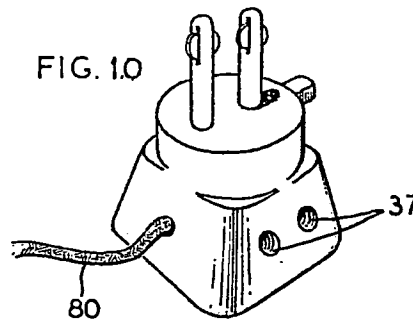


FIG. 11

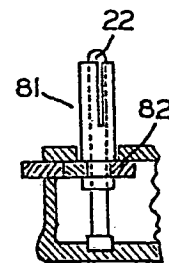


FIG. 12

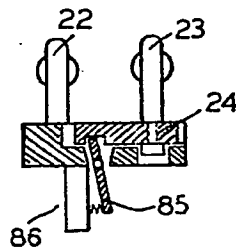


FIG. 13

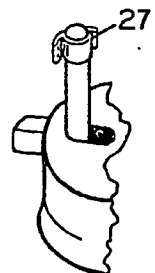


FIG. 14

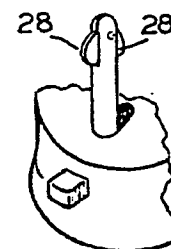


FIG. 15

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